

REMARKS/ARGUMENTS

Claims 1-14 and 16-19 remain in this application. Claims 1-6, 8, 10-14, and 16-19 have been amended. Claims 15 and 20 have been canceled without prejudice or disclaimer. Claim 20 had previously been withdrawn from consideration, without prejudice.

1. Claim Objections

The Patent Office has objected to claims 13-14 under 37 CFR §1.17(c) as being of improper dependent form for failing to limit the subject matter of a previous claim.

Applicants submit that the amendment to claims 13 and 14 obviate the objection and Applicants request removal of the objection and consideration of claims 13 and 14.

2. § 112 2nd Paragraph Rejection

The Patent Office has rejected claims 1-11 and 14-19 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Applicants submit that the amendments to the claims obviate the rejection. In particular, Applicants submit that the claims have been clarified in accordance with the Application as originally filed and no longer include references to “compound”, “entire glass portion”, “chlorine-compound-containing atmosphere”, “radial thickness”, “deuterium compound”, “reaction”, or “desired”. Accordingly, Applicants request withdrawal of the rejection and further consideration of the remaining claims 1-14 and 16-19.

2. § 103 Rejection

The Patent Office has rejected claims 1-11 and 14-19 under 35 U.S.C. § 103 as being unpatentable over Gilliland 4810276 in view of Burrus 4515612.

In view of the claims as amended, Applicants traverse the rejection.

The Patent Office states, *inter alia*, that Gilliland does not teach exposing the composite preform to an atmosphere containing deuterium. Applicants agree with that statement.

The Patent Office also states, *inter alia*, that “Burrus teaches exposing preforms to deuterium to lower fiber loss” (citing Burrus col. 2 lines 19-26), and that “this treatment can be applied to composite preforms” (citing Burrus col. 4 line 61 – col. 5 line 2), and that “the treatment can be applied at any time (col. 6 lines 34-37) including after each layer is made (col. 5 lines 55-61)”, and that Burrus “col. 5 lines 7-16 indicates that treatment can be done prior to consolidation and that such is ‘typically quite short’ ”, and that “it would have been obvious to treat with deuterium after each layer is deposited in the Gilliland/OVD method to lower fiber loss to the maximum extent”.

Applicants respectfully disagree.

Applicants note that they have found that it is possible to over-deuterate an optical fiber preform such that the fiber loss increases due to over-dosing the preform with deuterium, particularly when hydroxyl species (which present sites for D/H exchange) are present in the preform, such as when hydrogen, or hydrogen compounds, are introduced or re-introduced into the preform, such as by the deposition of a silica soot layer and the concomitant byproducts of the soot production. See present Specification Paragraph 0077, 0083 and Fig. 13. Thus, for example, even if a decrease in fiber loss due to OH can be achieved at around 1380 nm by extensive deuteration of a preform, increased losses at other wavelengths, such as at OD overtones at 1530 nm, 1590 nm, etc., can be induced by excessive deuteration.

Applicants submit that Burrus teaches away from the present invention by downplaying the impact of over-deuteration, for example at col. 1 lines 61-65:

“Of course, such deuterium/hydrogen (D/H) exchange results in the appearance of OD absorption lines in the relevant wavelength regime. However, these lines are due to higher overtones, *and thus weaker by typically 1-2 orders of magnitude.*” (emphasis added)

and at col. 3 lines 36-40:

“Any OD incorporated into the sample *contributes little* to absorption of light in the relevant wavelength regime since the specific absorption due to OD is *about two orders of magnitude less than that of OH* in the relevant wavelength region.” (emphasis added)

Thus, Burrus leads the skilled artisan away from taking into account the effects that deuteration can have on fiber loss.

Contrary to the teachings of Burrus, Applicants have found that deuterium overdosing can lead to significant losses in the C-band (around 1550 nm) and the L-band (around 1600 nm); for example, see lines A and B in Fig. 13 of the present Application.

Furthermore, Applicants submit that not only is Burrus directed to reducing OH-caused loss as measured *at the OH absorption peak at around 1.38-1.39 μm* (Burrus col. 1, lines 31-49, col. 2 lines 63-64, col. 7 lines 15, 37, 41-42), but Burrus does not even address (nor recognize) any significant impact on losses in the C-band or the L-band from overdosing with deuterium. That is, Burrus focuses on reducing losses due to OH at around 1.38-1.39 μm while disregarding the losses due to OD at other relevant wavelengths, such as in the C-band or L-band.

Applicants further submit that neither Gilliland nor Burrus teaches or even suggests depositing a layer of silica soot onto the outer surface of a consolidated glass preform precursor body to form a composite preform comprised of a consolidated glass portion and a silica soot portion and exposing the composite preform to an atmosphere containing a concentration of D_2 or D_2O or a mixture of D_2 or D_2O for a time and at a temperature sufficient to cause the D_2 or D_2O to penetrate the consolidated glass portion without entirely pervading the consolidated glass portion.

Applicants further submit that Burrus at col. 6 lines 34-37 does not state that “the treatment can be applied at any time”, but rather states: “Deuteration of the silica can of course take place at any appropriate stage of the article manufacturing process, for instance, after forming of the tube or rod.”

Applicants further submit that Burrus at col. 5 lines 55-61 refers to carrying out D/H exchange on layers of consolidated glass in an *MCVD* process, and Burrus col. 5 lines 55-61 does *not* address deuterium treatment of *layers of silica soot*, or of *layers of a*

composite glass/soot preform. Accordingly, Applicants submit that the citation of Burrus at col. 5 lines 55-61 is inapposite to the present claims.

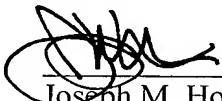
Based upon the above amendments, remarks, and papers of records, applicant believes the pending claims of the above-captioned application are in allowable form and patentable over the prior art of record. Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Applicant believes that no extension of time is necessary to make this Reply timely. Should applicant be in error, applicant respectfully requests that the Office grant such time extension pursuant to 37 C.F.R. § 1.136(a) as necessary to make this Reply timely, and hereby authorizes the Office to charge any necessary fee or surcharge with respect to said time extension to the deposit account of the undersigned firm of attorneys, Deposit Account 03-3325.

Please direct any questions or comments to Joseph M. Homa at 607-974-9061.

Respectfully submitted,

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